

Calibration Procedure

Certified Step Blocks

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1 Introduction and UUC Performance Requirements

1.1 This procedure describes the calibration of DeFelsko Corporation Certified Step Blocks.

Table 1-1

Model	Measurement Range
STDB1 & STDB1M	2.5 – 12.5 mm (0.100 – 0.500”)
STDUTGP	0.040” – 0.100”

1.2 The unit being calibrated will be referred to as the UUC (unit-under-calibration).

2 Measurement Standards and Support Equipment Performance Requirements

2.1 The UUC accuracy requirements are based upon the published UUC performance specifications.

2.2 The test uncertainty ratio applied in this Calibration Procedure is 4:1 unless otherwise stated.

2.3 The Minimum-Use-Specifications are the minimum test equipment specifications required to meet all the UUC accuracy requirements and the test uncertainty ratio applied.

Table 2-1 UUC Accuracy Requirements and Description

Model	Range	Performance Specifications	Test Method
STDB1 & STDB1M	2.5 – 12.5 mm (0.100 – 0.500”)	± 0.025 mm (± 0.001”)	Height Gage
STDUTGP	0.040” – 0.100”	± 0.025 mm (± 0.001”)	Height Gage

Table 2-2 Minimum Use Specification

Range	Accuracy
1.0 – 12.7 mm (0.040 – 0.500”)	± 6.25 um (± 0.25mil)

Table 2-3 Actual Equipment Specification

Equipment Generic Name	Range	Accuracy	Manufacturer/Model #'s Applicable
Height Gage	0 – 25.4 mm (0 – 1”)	± 0.10 um* (± 0.004 mils)	Heidenhain CT2501 with ND287 display

*Measurement is rounded so effective accuracy is ± 0.1mils (± 2 um).

Caution: The instructions in this Calibration Procedure relate specifically to the equipment and conditions listed in Section 2. If other equipment is substituted, the information and instructions must be interpreted accordingly.

Table 2-4 Calibration Environmental and Warm-up Requirements

Measurement Standards & Support Equipment Environmental Requirements:	Temperature: $23 \pm 5^{\circ}$ C. Relative Humidity: Less than 95%
Measurement Standards & Support Equipment Warm-up and Stabilization Requirements:	15 minutes

3 Preliminary Operations

Note: Review the entire document before starting the calibration process.

- 3.1 Inspect the top and bottom surfaces of the UUC for defects that could impact accuracy such as pits, burrs, contamination or corrosion.
- 3.2 For new production, verify material certificate was provided.
- 3.3 Using a cotton swab and alcohol clean the top and bottom surfaces of the UUC.
- 3.4 Ensure the indicator has been properly zeroed and the process monitoring measurement has been performed per MP5044.
- 3.5 Ensure the normal rounded tip is installed and the pressure controller is set to 3. Turn on the vacuum pump (except for STDUTGP blocks).

4 Calibration/Recertification Process

Note: Whenever the test requirement is not met, verify the results of each test and take corrective action before proceeding.

- 4.1 Review the appropriate Performance Requirements Table in Section 5.
- 4.2 Take three measurements in the center of the thinnest step of the UUC recording all digits in the value. Take readings in inches for the STDB1 and STDUTGP blocks and millimeters for the STDB1M.
- 4.3 Determine the average of these readings and round the reading to the nearest 0.0001” for inch measurements and the nearest 0.002 mm for metric. Verify all the individual measurements are within ± 0.0001 ” or ± 0.002 mm of the average.
- 4.4 Record the serial number, average readings and material heat number on the calibration certificate.

5 Performance Requirements

Note: The technician shall collect the data needed to complete the appropriate table below. Do not write in this procedure.

Table 5-1a STDB1 Performance Requirements and Data

Nominal (inches)	Reading 1	Reading 2	Reading 3	Average*
0.100				
0.200				
0.300				
0.400				
0.500				

*Min. allowed = Nominal – 0.0010

*Max. allowed = Nominal + 0.0010

Table 5-1b STDB1M Performance Requirements and Data

Nominal (mm)	Reading 1	Reading 2	Reading 3	Average*
2.5				
5.0				
7.5				
10.0				
12.5				

*Min. allowed = Nominal – 0.025

*Max. allowed = Nominal + 0.025

Table 5-1c STDUTGP Performance Requirements and Data

Nominal (inches)	Reading 1	Reading 2	Reading 3	Average*
0.040				
0.060				
0.080				
0.100				

*Min. allowed = Nominal – 0.0010

*Max. allowed = Nominal + 0.0010

